

REMARKS

The Office Action of April 29, 2005 objected to certain claims and rejected other claims. Applicants have reviewed the application and to correct typographical errors, Applicants have amended the specification claims and submitted replacement drawings. The Section 103 rejections are traversed by Applicants. Applicants request withdrawal of all objections and rejections.

The Section 103 Rejections

Claims 1, 2, 5-9 and 14-16 were rejected under 35 U.S.C. § 103(a) as unpatentable over Shi et al. (U.S. Pat. 6,641,702) in view of Sato et al. (U.S. Pat. 5,286,296). The Office Action noted that:

Regarding claim 1, Shi et al. teach a fabrication system in Figs. 5 and 6. (See Figs. 5 and 6) Shi et al. teach a main housing chamber 41 provided with several small chambers or stations 42. In each station is provided a planar-magnetron-sputtering cathode 43 or a pair of facing-targets-sputtering cathode 44. The main chamber and each station have their own vacuum pumping means and gas-supplying component (not shown). (Column 7 lines 1-18)... The differences between Shi et al. and the present claims are that the use of an inert gas as the admitted gas is not discussed (Claim 1) and utilizing the apparatus for semiconductor fabrication is not discussed (Claim 1).

Shi et al. suggest utilizing argon for the sputtering gas. (Column 1 lines 10-17).

Sato et al. suggest inserting an inert gas such as nitrogen or argon into the transfer chamber. (Column 2 lines 63-68 Column 1-3).

The motivation for utilizing argon gas in the chambers that it allows for sputtering of the target and preventing contamination of the deposition chambers. (Column 3 lines 4-6) Sato et al. suggest that multichamber apparatus can be used for fabricating semiconductors. (Column 1 lines 8-10).

The motivation for utilizing a multichamber apparatus is that it allows for fabricating semiconductors of high complexity with different processes. (Column 1 lines 10-18).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Shi et al. by utilizing argon as taught by Shi et al. and Sato et al. and to have utilized a multichamber apparatus for fabricating semiconductor substrates s taught by Sato et al. because it allows for sputtering a target

with prevention of contamination of the deposition chambers and for fabricating semiconductors with high complexity.

Applicants respectfully traverse the rejection. Shi relates to a sputtering device for depositing multi-layer films on a substrate, the sputtering device comprising at least one planar-magnetron-sputtering-cathode and at least one facing-targets-sputtering-cathode housed in a single vacuum chamber, and adapted such that each planar-magnetron-sputtering-cathode and facing-targets-sputtering-cathode can be selectively positioned for sputtering deposition onto a substrate (Abstract).

Sato shows a plurality of process chambers for processing a single wafer connected with a wafer transfer chamber in parallel through respective gate valves. In Sato, a wafer transfer means is provided for carrying the wafer between the wafer transfer chamber and each process chamber through one of the gate valves, there are further provided a plurality of vacuum pumps in order to prevent cross contamination among processes, improve throughput and prevent condensation in the process chambers. The vacuum pumps are connected with the wafer transfer chamber, and designed to reduce the pressure in the wafer transfer chamber to different vacuum levels.

First, the independent claims are allowable because a claim element is not shown. Neither Shi nor Sato shows the claimed "a plurality of adjacent deposition chambers positioned within the air-tight housing." As shown in Shi's FIGS. 5-6, the Shi main chamber 41 has several small chambers or stations 42 (only 4 are shown). The symmetric centers of all the stations 42 are positioned on a circle's circumference 9 having a suitable diameter, as shown in FIG. 6. In each station is provided a planar-magnetron-sputtering-cathode 43 or a pair of facing-targets-sputtering-cathode 44. Shi at Col. 7 lines 1-17. Shi's chamber is symmetrically positioned on a circle and rotates rather than move in a linear direction. Moreover, Shi's chamber is separated. These differences compel the conclusion that Shi and Sato cannot render the claimed invention obvious.

To contrast the differences, in one embodiment of the instant specification noted on page 13 of the specification, "The chambers share magnets. Moreover, the system as shown in Fig. 4A-4B provides a plurality of one dimensional sputter deposition chambers. Each pattern can be controlled by varying the voltage to the plates, as shown in Fig. 4C. Each chamber can deposit a line of material. By moving the wafer 300 with the linear motor 460, 2-d coverage is obtained.

Additionally, the system allows multi-layer deposition in the same chamber, thus minimizing contamination and increasing deposition throughput.” Shi fails to show the linear movement possible with adjacent chambers and Shi certainly cannot share components such as magnets. Hence, Shi cannot provide a number of claimed features such as a linear motor to move the rotary chuck and sequentially expose the wafer to a plurality of chambers; each chamber provides a collimated deposition pattern; each chamber further comprises a door that opens during each chamber’s deposition and closes when the chamber is not depositing; each door comprises a baffle to catch falling particulates; or wherein the chambers share magnets.”

Second, Applicants note that no motivation or suggestion, either in the cited art reference or in the knowledge generally available to one of ordinary skill in the art, has been cited by the Examiner to modify the Shi reference with Sato so as to produce the claimed invention. Further, Applicants fail to identify any motivation to modify the reference teaching so as to provide the adjacent deposition chambers positioned within the housing as presently claimed. Applicants point out that the Examiner bears the initial burden of factually establishing and supporting any *prima facie* conclusion of obviousness. *In re Rinehart*, 189 U.S.P.Q. 143 (CCPA 1976); M.P.E.P. § 2142. If the Examiner does not produce a *prima facie* case, the Applicant is under no obligation to submit evidence of nonobviousness. *Id.* In the instant case, the Examiner has not pointed to any evidence in Shi, or how knowledge of those skilled in the art, provide a suggestion or motivation to modify the reference teaching so as to produce the claimed invention of claim 1. See *In re Zurko*, 59 U.S.P.Q.2d 1693 (Fed. Cir. 2001) ([I]n a determination of patentability the Board cannot simply reach conclusions based on its understanding or experience - or on its assessment of what would be basic knowledge or common sense. Rather, the Board must point to some concrete evidence in the record in support of these findings).

Under *Vaeck*, absent any evidence of a cited suggestion or reasonable motivation in either Shi or Sato reference, or knowledge of those skilled in the art, to provide a plurality of adjacent deposition chambers positioned within the housing, *prima facie* obviousness of the claims has not been established. As such, it is respectfully requested that the § 103(a) rejection of each independent claim and those dependent therefrom be withdrawn.

For example, claims 3, 4 and 13 were rejected under 35 U.S.C. 103(a) as unpatentable over Shi et al. in view of Sato et al. as applied to claims 1, 2, 5-9 and 14-16 above, and further in

view of Kawakubo et al. (U.S. Pat. 6,077,406). Again, none of the references show adjacent deposition chambers and the foregoing arguments apply in traversing this rejection.

Claim 10 was rejected under 35 U.S.C. 103(a) as being unpatentable over Shi et al. in view of Sato et al. as applied to claims 1, 2, 5-9 and 14-16 above, and further in view of Horne et al. (5,344,352). The Office Action noted that "Horne et al. teach utilizing collimators in each deposition chamber to deposit films on a substrate. (Column 6 lines 11-26) The motivation for utilizing collimators in each deposition chamber is that it allows for depositing at different rates on the substrate. (Column 6 lines 11-26). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized collimators in each of the deposition chambers as taught by Horne et al. because it allows for depositing at different rates on the substrate." Although Horne shows collimators, there is no suggestion to combine Horne with FTS deposition. Further, none of the references show adjacent deposition chambers and the foregoing arguments apply in traversing this rejection of claim 10. Similarly, the rejection of claims 11-17 are traversed.

Claims 18-20 were rejected under 35 U.S.C. 103(a) as being unpatentable over Dubs et al. (U.S. Pat. 6,899,795) in view of Ashtiani et al. (U.S. Pat. 6,497,796) and Strahl (U.S. Pat. 4,664,935). The Office Action noted that:

Dubs et al. teach in Fig. 4 providing a plurality of deposition chambers 10a and 10b each having at least one magnetron target for coating. A substrate carrier 5 holds a substrate for rotation and movement in Z direction and in the X direction. The substrate is supported underneath. (See Fig. 4; Column 5 lines 40-48)

The differences between Dubs et al. and the present claims is that utilizing a magnetic field normal to the substrate is not discussed, back biasing the substrate is not discussed, and utilizing a pendulum is not discussed.

Ashtiani et al. teach utilizing a magnetic field normal to the substrate in Figs. 17A and 17B for improving step coverage. (See Figs. 17A and 175; Column 12 lines 52-65) The motivation for utilizing a magnetic field normal to the substrate is that it allows for improving step coverage. (Column 12 lines 52-65)

Strahl discussed above teach a substrate holder that moves like a pendulum. (See Strahl discussed above) A DC bias can be applied to the workpiece. (Column 2 lines 16-19) The motivation for utilizing a DC bias is that it allows for improving step coverage. (Column 2 lines 16-19)

Applicants respectfully traverse the rejection of claim 18. Here, neither Dubs, Ashtiani, nor Strahl shows the claimed adjacent deposition chambers. They also do not show the sharing

of the magnets among chambers. Hence, the foregoing arguments apply with equally great force in traversing the rejection of claims 18 and dependent claims 19-20.

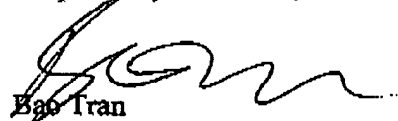
As the references do not show providing a plurality of adjacent deposition chambers, each sharing at least a magnet with a neighboring chamber and having at least one target and a substrate having a film-forming surface portion and a back portion, the rejection of claims 18-20 is inappropriate. Withdrawal of all Section 103 rejection is requested.

CONCLUSION

Applicant believes that the above discussion is fully responsive to all grounds of rejection set forth in the Office Action.

If for any reason the Examiner believes that a telephone conference would in any way expedite prosecution of the subject application, the Examiner is invited to telephone the undersigned at (408) 528-7490.

Respectfully submitted,



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